

What Is Claimed Is:

1. An ultrasonic flow sensor for measuring the volumetric flow rate of a flowing medium through a flow channel (24), having a transducer array (2) which is situated within the flow cross section of the flow channel (24) and which generates ultrasonic waves (27) which propagate in the flow cross section of the flow channel (24) transversally to a flow direction (14) of the flowing medium, wherein the ultrasonic transducer array (2) has an interlaid arrangement of transducer elements (4) which act alternately as transmitting (10) and receiving elements, so that all emitted individual sound waves (27) interfere to form common wave fronts (28).
2. The ultrasonic flow sensor as recited in Claim 1, wherein the individual transducer elements (4) in the interlaid transducer array (2) are decoupled from one another by separating trenches (3).
3. The ultrasonic flow sensor as recited in Claim 1, wherein the interlaid ultrasonic transducer array (2) is associated with a reflection surface (13) having a radius of curvature (19) and is separated from it by a distance (18, 25).
4. The ultrasonic flow sensor as recited in Claim 3, wherein the radius of curvature (23) of the reflection surface (13) is twice the tube diameter (20) of the flow channel (17).
5. The ultrasonic flow sensor as recited in Claim 1, wherein the interlaid ultrasonic transducer array (2) is mounted on a wall causing a cross-section narrowing of the partial flow cross section of the flow channel (24).
6. The ultrasonic flow sensor as recited in Claim 5, wherein the constriction of the flow tube (24) causing the cross-section narrowing contains curvatures pointed toward the reflection surface (13).
7. The ultrasonic flow sensor as recited in Claim 1, wherein it includes an analyzer circuit which scans the individual receiving elements of the interlaid transducer array (2) using a controllable signal multiplexer, supplies

the received signals to an analog signal processor (36), which has a comparator (31) and a sample-and-hold amplifier (32) connected downstream from it.

8. The ultrasonic flow sensor as recited in Claim 1,  
wherein the interlaid transducer array (2) has strip-shaped electrodes (5) on a top side (8) which are separated from flat counterelectrodes (7) by a PVDF film (6).
9. The ultrasonic flow sensor as recited in Claim 8,  
wherein there is a seal (12) above the flat counterelectrode (7).
10. The ultrasonic flow sensor as recited in Claim 1,  
wherein a shift of a linear focus (29) from a first position (29.1) to a second position (29.2) is detected.